भारतीय मानक

Indian Standard

IS 9203 (Part 3) : 2023

खदान ढुलाई पटरियों के लिए घर्षण रोलर — विशिष्टि

भाग 3 शुंडाकार एवं ऊर्ध्वाधर रोलर और क्षैतिज एवं ऊर्ध्वाधर घिरनी

(पहला पुनरीक्षण)

Friction Rollers for Mine Haulage Tracks — Specification

Part 3 Tapered and Vertical Rollers and Horizontal and Vertical Pulleys

(First Revision)

ICS 73.100.40

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June 2023 **Price Group 5**

Mining Techniques and Equipment Sectional Committee, MED 08

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Mining Techniques and Equipment Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was first published in 1979. This standard is being revised again to keep pace with the latest technological developments and international practices. Also, in this revision, the standard has been brought into latest syle and format of Indian Standards, and references to Indian Standards, wherever applicable have been updated. BIS certification marking clause has been modified to align with the revised *Bureau of Indian Standards Act*, 2016.

This standard on 'Friction rollers for mine haulage tracks Part 3 Tapered and vertical rollers and horizontal and vertical pulleys' is one of the series of standards on friction rollers. Other parts of this standard are:

IS 9203 Part 1 Technical supply conditions.
IS 9203 Part 2 Parallel rollers.
IS 9203 Part 4 Rollers with non-metallic rope-bearing surfaces.

The composition of the Committee responsible for the formulation of this standard is listed in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be same as that of the specified value in this standard.

Indian Standard

FRICTION ROLLERS FOR MINE HAULAGE TRACKS — SPECIFICATION

PART 3 TAPERED AND VERTICAL ROLLERS AND HORIZONTAL AND VERTICAL PULLEYS

(First Revision)

1 SCOPE

Covers the requirements for tapered and vertical rollers and horizontal and vertical pulleys.

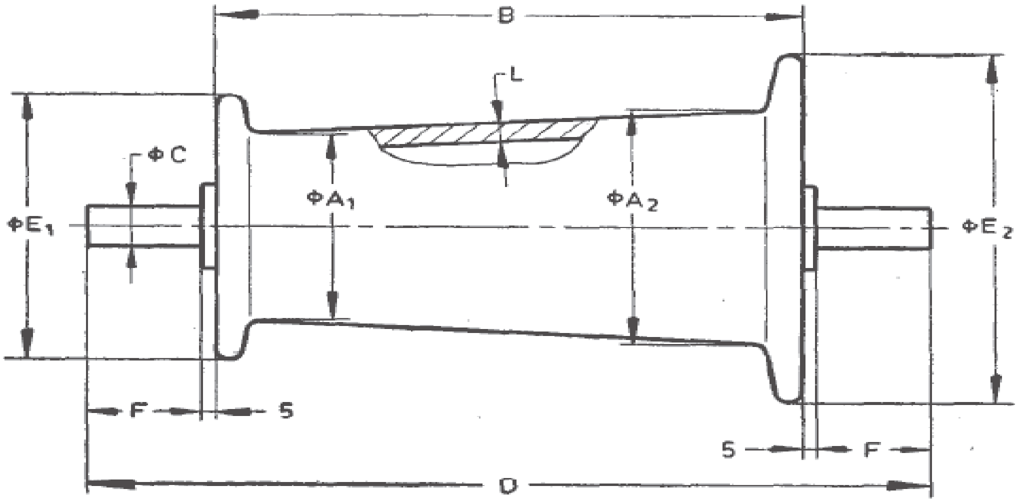
2 REFERENCES

The standards listed below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below:

IS No.	*Title*
IS 9203	Friction rollers for mine haulage tracks — Specification:
(Part 1) : 1979	Technical supply conditions;
(Part 2) : 1979	Parallel rollers.

3 DIMENSIONS

3.1 Tapered Rollers

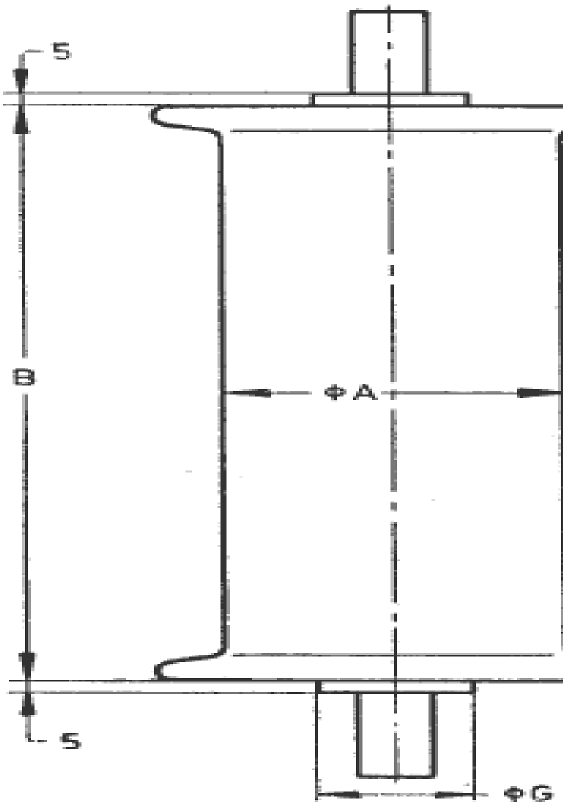


All dimensions in millimetres

FIG. 1 TAPERED ROLLERS

Sl No.	*Nominal Size*	A_1 ± 1·6	A_2 ± 1·6	*B* ± 1·6	*D* ± 1·6	E_1 ± 1·6	E_2 ± 1·6	*F*	*L* +0 -1·6	*C*	
										Plain Bearing	*Rolling Bearing*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i)	TR 1	100	125	230	330	140	165	45	10	22	19
ii)	TR 2	125	150	300	400	165	190	45	10	22	19
iii)	TR 3	150	200	300	430	190	250	60	13	29	25
iv)	TR 4	200	250	400	530	250	300	60	13	29	25

3.2 Vertical Rollers



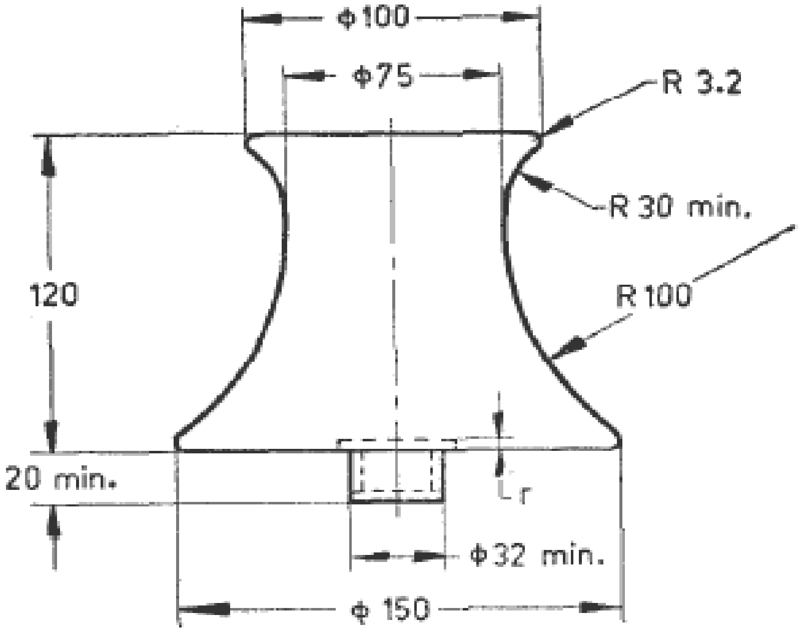
All dimensions in millimetres

FIG. 2 VERTICAL ROLLERS

Sl No.	*Nominal Size*	*Principal Dimensions*			*For Detailed Dimensions, see IS 9203 (Part 2) for Following Nominal Size*
(1)	(2)	(3)	(4)	(5)	(6)
i)	VCP 1	100	300	45	CP 2
ii)	VCP 2	115	300	45	CP 4
iii)	VCP 3	150	460	45	CP 10
iv)	VCP 4	300	300	75	CP 12
v)	VCR 1	100	300	65	CR 2
vi)	VCR 2	115	300	65	CR 4
vii)	VCR 3	150	460	80	CR 10
viii)	VCR 4	300	300	100	CR 12
ix)	VFP 1	100	300	45	FP 2
x)	VFP 2	115	300	45	FP 4
xi)	VFP 3	150	460	45	FP 10
xii)	VFP 4	300	300	75	FP 12
xiii)	VFR 1	100	300	65	FR 2
xiv)	VFR 2	115	300	65	FR 4
xv)	VFR 3	150	460	80	FR 10
xvi)	VFR 4	300	300	100	FR 12

3.3 Vertical Pulleys

3.3.1 *Small Pulley* (*Nominal Size - VP* 1)



All dimensions in millimetres

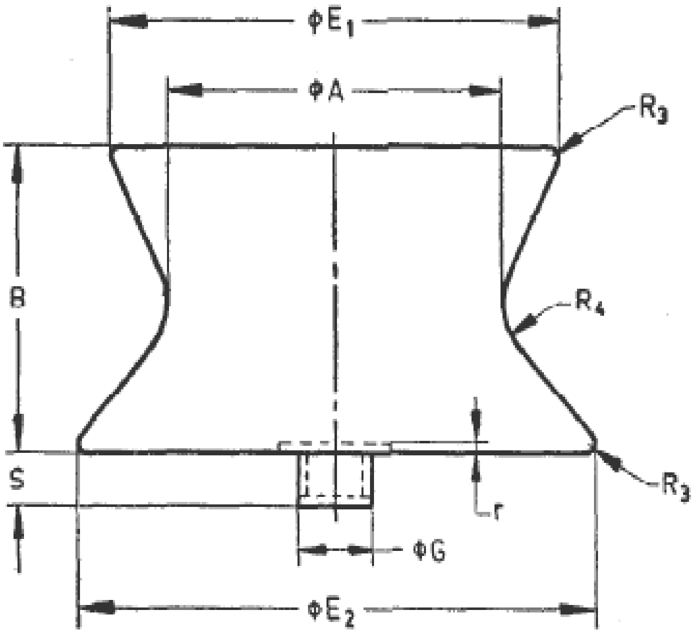
FIG. 3 SMALL PULLEY

3.3.1.1 The bearing face or boss shall be recessed to a maximum depth *r* of 3.2 mm.

3.3.1.2 A headed stub-spindle may be used with a head not less than 6 mm thick and 42 mm in diameter.

3.3.1.3 Tolerance on all dimensions shall be ± 1.6 mm.

3.3.2 *Large Pulley*



All dimensions in millimetres

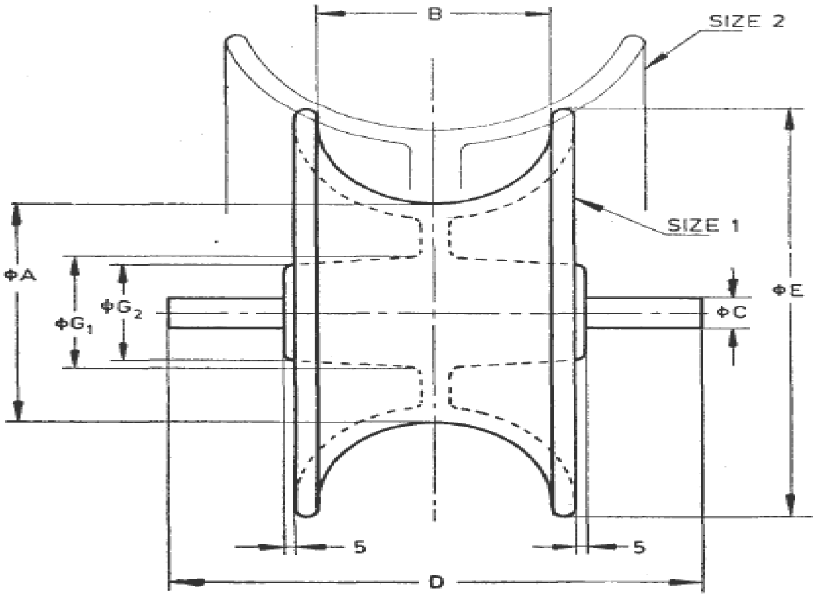
FIG. 4 LARGE PULLEYS

Sl No.	*Nominal Size*	*A*	*B*	*E_1*	*E_2*	*G*	*R_3*	*R_4*	*S*
		± 1·6	*± 1·6*	*± 1·6*	*± 1·6*	*Min*	*± 1·6*	*± 1·6*	*Min*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
i)	VP 2	150	115	200	230	32	3·2	25	20
ii)	VP 3	150	115	200	300	32	3·2	25	20

3.3.2.1 A headed stub-spindle may be used with a head not less than 6 mm thick and 42 mm in diameter.

3.3.2.2 The tearing face or boss shall be recessed to a maximum depth *r* of 3.2 mm.

3.4 Horizontal Pulleys



All dimensions in millimetres

FIG. 6 HORIZONTAL PULLEYS

Sl No.	*Nominal Size*	*A*	*B*	*D*	*E*	*With Rolling Bearing*			*With Plan Bearing*		
						C	*G_1*	*G_2*	*C*	*G_1*	*G_2*
(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)		(9)	(10)
i)	HP 1	150	130	250	280	20	75	65	22	60	50
ii)	HP 2	250	175	300	380	25	90	85	30	70	65

3.4.1 Tolerance on machined surfaces shall be ± 0.8 mm and on cast, surfaces shall be ± 3.2 mm.

4 GENERAL REQUIREMENTS

Shall conform in all respect with IS 9203 (Part 1).

5 CONSTRUCTION

Type of Roller or Pulley	*Construction*
Tapered rollers	a) Cast roller, bored and fitted with pressed-in spindle or b) With cast-in spindle; plain bearing in the mounting or c) With separate spindle; plain bearing in the roller or d) With separate spindle; roller bearing in the roller
Vertical rollers	a) With separate spindle; plain bearing within the roller or b) With separate spindle; roller bearing within the roller
Vertical pulleys	The spindle shall be fixed in the mounting. The bearing of either plain or rolling type shall be within the pulley. The pulley may be supplied either with or without a mounting plate
Horizontal pulleys	a) With cast-in spindle; plain bearings in mounting or b) With separate spindle; plain bearing in roller or c) With separate spindle; roller bearing in roller

6 DESIGNATION

The pulleys and rollers conforming to this standard shall be designated by commonly used name, nominal size given against each (*see* **3.1** to **3.4**), and the number of this standard.

Example:

> A tapered roller of nominal size TR 3 shall be designated as:
>
> Tapered Roller TR 3 IS 9203 (Part 3)

7 MARKING

Each roller shall be marked legibly on the flange with the following information:

a) Manufacturer’s name or identification mark; and

b) When cast, an indication of the material used.

NOTE — Letters S, SA, I, and IA shall be used to indicate cast steel, cast alloy steel, cast iron, and alloy cast iron respectively.

7.1.1 BIS Certification Marking.

The Friction rollers may also be marked with Standard Mark.

7.1.2 The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

8 SELECTION OF ROLLERS

8.1 Rollers having cast-in spindles shall not be used at roller speeds exceeding 200 rev/min.

8.2 Roller bored and having pressed-in spindles designated to run in external plain bearings shall not be used at speeds above 500 rev/min.

8.3 Roller with rolling bearings shall be used at speeds above 500 rpm and shall be seriously considered for speeds lower than this where loading is excessive, for example, on brow of a gradient.

8.4 Rollers with impregnated self-lubricated bearings shall be preferred for speeds around 1 000 rpm.

8.5 The use of sealed, grease-packed, or impregnated bearing is preferable from the maintenance point of view.

8.6 In the case of vertical pulleys, pulleys of nominal size VP 2 and VP 3 shall be preferred provided that circumstances necessitate the use of pulleys of nominal size VP 1.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Mining Techniques and Equipment Sectional Committee, MED 08

Organization	*Representative(s)*
Directorate General of Mines Safety, Dhanbad	Shri Saifullah Ansari (***Chairperson***) Shri M. Arumugam (*Alternate*)
Andhra Pradesh Heavy Machinery and Engineering Limited, Vijaywada	Shri T. V. Ramana
BEML Limited, Bengaluru	Shri V. R. S. Prasad Rao Shri H. G. Suresh (*Alternate*)
Bharat Coking Coal Limited, Dhanbad	Shri P. K. Sinha
CSIR — Central Institute for Mining and Fuel Research, Dhanbad	Dr Manoj Kumar Singh Shri Surajit Dey (*Alternate*)
Caterpillar India Private Limited, Chennai	Shri K. Reji Jose
Eastern Coalfields Limited, Dishergarh	Dr Manas Kumar
Eimco Elecon (India) Limited, Vallabh Vidyanagar	Shri Bhavin K. Bhatt
Hindustan Zinc Limited, Kolkata	Shri B. V. Rao
Indian Institute of Technology (ISM), Dhanbad	Shri L. A. Kumaraswamidhas
John Deere India Private Limited, Mumbai	Shri Karthik Kaliappan
Manganese Ore Limited, Nagpur	Shri Atul Sharma Shri Rakesh Ku Verma (*Alternate* I) Shri Ashwini Baghele (*Alternate* II)
Nanda Millar Company, Kolkata	Shri J. P. Goenka Shri Madhur Goenka (*Alternate*)
National Mineral Development Corporation, Hyderabad	Shri D. Rajasekaran
South Eastern Coalfields Limited, Bilaspur	Shri Kapil K. Rai Shri D. Bhattacharjee (*Alternate*)
Tata Steel Limited, Dhanbad	Shri Abinash Jha Shri Soumendhu Manjhi (*Alternate*)
BIS Directorate General	Shri Rajneesh Khosla, Scientist 'F'/Senior Director and Head (Mechanical Engineering) [Representing Director General (*Ex-officio*)]

Member Secretary
Shri Sandeep Keshav
Scientist 'C'/Deputy Director
(Mechanical Engineering), BIS

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.

This Indian Standard has been developed from Doc No. :MED 08 (19561)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Published by BIS, New Delhi